



# A-Z of Inventions and Discoveries

## Activities and BLMs

Text by Justine Ryan | Teaching framework designed by Charlotte Forwood and Sharon McCormack

Edited by Kerry Nagle | Paged by Sally Bond

### Titles in the series



*Agriculture*



*Health*



*Home*



*Technology*

Author Cameron Macintosh



# Agriculture

## Introduction

*Agriculture* introduces us to the innovations in tools and techniques used by Aboriginal people in hunting and gathering food and managing their environment. The text then explains how European settlers coped with unfamiliar farming conditions through their innovations. It also describes how farmers invented machinery to manage Australia's unique agricultural conditions and discusses how scientists have developed ways of controlling pests and introduced species.

## Australian Curriculum Links

This text links with the Australian Curriculum in History and Science at Year 5.

## Understandings

- Aboriginal people used innovations in tools and techniques to make their hunting and gathering food from the land more effective, while European settlers used innovations to adapt their animals and crops to unfamiliar farming conditions.
- Harsh Australian conditions meant that farmers had to create clothing and crops and breed animals to suit those conditions.
- Australian farmers are creating inventions that care for our environment.

## Vocabulary

cross-bred, drought-resistant, engineer, factory farms, fungus, genetic engineering, hydro-electric, immune, import, intellectual property, irrigate, organic farming, patent, plague, ploughshare, renewable, sterile, surveyor, thresh, vaccine, virus, winnow, yields

## Focusing

### Discussion questions

Have students answer these questions orally to focus on the text.

#### **Literal:**

- Why do Aboriginal people have a deep understanding of the land? (They have lived in Australia for thousands of years.)
- How did Aboriginal people encourage some food plants to grow in greater numbers? (By using fire, replanting parts of root vegetables)
- How does the stump-jump plough work? (A dangling ploughshare jumps when it touches roots and stones, then digs the soil.)
- Why did South Australian farmers need more labour during the 1840s? (Wheat crops were so large.)
- Why was a law passed in the 1950s not allowing chickens to enter Australia? (Importing chickens was stopped to prevent livestock disease from entering Australia.)
- What did prickly pear cactus do to Australian farmland? (It spread so much that it ruined over 25 million hectares.)
- What is dynamic lifter? (All-natural plant food)
- How did Australia become a wealthy country? (By grazing sheep for wool)
- Who discovered the anti-anthrax vaccine? (John McGarvie Smith)

**Inferential:**

- Why is the Howard Rotavator useful for farmers?
- Explain how the Melbourne suburb of Sunshine got its name.
- How did the 1950s law preventing chickens from being imported help the Australian chicken industry?
- What are the difficulties in Australia surrounding sugarcane harvesters?
- When was the Akubra first made famous by Australians?
- Why would a locust plague be detrimental to Australian farmers?
- Why did the people of Boonarga build a hall in honour of a moth?
- How do dung beetles help to clean up cow pastures?

**Evaluative:**

- Did the Aboriginal people's methods of agriculture help European settlers?
- Why do you think neither Bull nor Ridley patented their machines?
- Why is it important that Australia has very strict controls over what comes into the country?

## Engaging

<b>Learning experience 1</b>	<b>Aboriginal people used innovations in tools and techniques to make their hunting and gathering food from the land more effective, while European settlers used innovations to adapt their animals and crops to unfamiliar farming conditions.</b>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 4–13 of <i>Agriculture</i></li> <li>• BLM 1</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Identifying</li> <li>• Listing</li> <li>• Using persuasive language</li> <li>• Recording thoughts and feelings</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Designing</li> <li>• Cause and effect</li> <li>• Innovating</li> <li>• Comparing</li> </ul>
<b>Activity</b>	<p><b>1</b> ‘When European settlers reached Australia, everything was new to them.’ Re-read page 4 of <i>Agriculture</i> and discuss. Ask, Why did settlers to Australia have to innovate in order to survive? Why did Australian farmers have to innovate when tools broke down? Why did European settlers persevere with ‘living off the land’? Create a class list of reasons why European settlers persevered.</p> <p><b>2</b> Have students re-read pages 10–11 and discuss the wheat stripper. Ask, Why did farmers need a piece of machinery to strip the wheat? Have students design a poster that advertises for someone to invent a machine that can harvest huge amounts of grain.</p>
<b>Going further</b>	<p><b>3</b> Discuss with students pages 6–7 of <i>Agriculture</i>. Ask, How did Aboriginal people innovate to get eels, zamia plants, fish and kangaroos? Have students use BLM 1 to compare each Aboriginal innovation with a similar European one.</p> <p><b>4</b> As an extension, have students re-read ‘Did you know?’ on page 11 of the text. Discuss with students the fact that most of Canberra’s suburbs are named after famous Australians who have contributed to the existence of Australia as a nation. Ask students to investigate other suburbs that are named after someone famous or an invention, for example, Sunshine (in Melbourne) is named after the Sunshine harvester. Have students record and share their findings with their peers.</p>
<b>Assessment</b>	Assess students’ ability to understand how Aboriginal people and European settlers used innovations and inventions to suit their needs, based on their comparison of Aboriginal and European farming innovation and investigation into suburb names.

Learning experience 2	Harsh Australian conditions meant that farmers had to create clothing and crops and breed animals to suit those conditions.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 14–21 of <i>Agriculture</i></li> <li>• BLM 2</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Recording ideas visually</li> <li>• Reporting</li> <li>• Locating and selecting relevant information</li> <li>• Making connections</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Presenting</li> <li>• Applying and transferring relevant information</li> <li>• Arranging</li> <li>• Cause and effect</li> </ul>
<b>Activity</b>	<p><b>1</b> Have students re-read pages 16–17 of <i>Agriculture</i> and discuss what items of clothing have been invented for farmers and other workers to suit Australian conditions. Ask, What items of clothing have been invented? Why is the jacket designed by Edward Le Roy called a Driza-Bone? What is an Akubra made from? Which harsh Australian conditions does the clothing protect against? Would these items of clothing suit people in other countries? Have students draw a labelled picture of an Australian farmer wearing Australian-designed clothing, such as a Driza-Bone, an Akubra and Blundstone or R.M. Williams boots.</p> <p><b>2</b> Have students re-read about CSIRO on page 19 of <i>Agriculture</i>. Discuss with students what CSIRO stands for and what it does. Ask, Why is CSIRO important to Australian farmers, Australians in general and other farmers worldwide? Have students re-read the entire text and make a note each time CSIRO is mentioned. Encourage students to write a news report explaining how CSIRO has helped the farming industry in Australia.</p>
<b>Going further</b>	<p><b>3</b> Discuss with students ‘introduced species’. Ask, What is considered an introduced species? Why are introduced species a threat? Name three introduced species to Australia that have caused damage. Name three introduced species that have not done any damage. Name three species that were not introduced. Have students complete the cause-and-effect graphic organiser on BLM 2, illustrating the effect of four introduced species that have been harmful to Australia.</p> <p><b>4</b> As an extension, discuss with students the importance of strict laws that do not allow harmful plants, animals and foods to enter Australia. Have students investigate what the present laws are and identify any additional laws that may be necessary to protect the environment.</p>
<b>Assessment</b>	Assess students’ ability to understand how farmers cope with harsh Australian conditions, through class discussions, their cause-and-effect graphic organiser and a newspaper report on CSIRO.

Learning experience 3	Australian farmers are creating inventions that care for our environment.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 22-29 of <i>Agriculture</i></li> <li>• BLM 3</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Illustrating ideas</li> <li>• Researching information</li> <li>• Identifying positives and negatives</li> <li>• Locating and selecting information</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Making connections</li> <li>• Design</li> <li>• Presenting</li> <li>• Comparing</li> </ul>
<b>Activity</b>	<ol style="list-style-type: none"> <li>1 Discuss permaculture with students. Ask, What is permaculture? Where was it developed? How does permaculture connect everything within the system? Have students create a PMI graphic organiser on BLM 3 illustrating the positive, minus and interesting aspects of permaculture.</li> <li>2 Have students re-read about the ShearEzy on page 24 of <i>Agriculture</i>. Ask, How has the ShearEzy made a shearer's job easier? How many sheep can a shearer shear in a day? Why is this good for farmers? Who developed the ShearEzy? Have students create a graphic organiser that illustrates the advantages and disadvantages of the ShearEzy for farmers, shearers and sheep.</li> <li>3 Have students re-read pages 28–29 of <i>Agriculture</i>. Discuss with students the steel windmill and the Dethridge water meter wheel. Ask, Why were they originally invented? How do these inventions help Australian farmers? Have students draw a labelled diagram of either the steel windmill or the Dethridge water meter wheel that shows an understanding of how the invention helps Australian farmers.</li> </ol>
<b>Going further</b>	<ol style="list-style-type: none"> <li>4 As an extension, re-read page 23 of <i>Agriculture</i> and discuss with students the permaculture village of Crystal Waters. Have students design a permaculture school, using the guidelines set out by the permaculture village.</li> <li>5 'Australian farmers try to grow crops in ways that protect our natural resources.' Discuss with students how this is being done at the moment. Encourage students to think of new ways to farm that protects the environment. Have students share their ideas with their peers.</li> <li>6 Consider with students the numerous inventions Australians have contributed to world farming. Ask, Have Australian farmers made life easier for farmers worldwide? Why have Australian farmers contributed so widely to farming? Have students investigate how other countries have contributed to farming worldwide. Ask, What farming inventions do Australians use that were invented elsewhere?</li> </ol>

<b>Assessment</b>	Assess students' ability to understand how Australian farmers are creating inventions that care for our environment, through class discussions, design of a permaculture school and a permaculture PMI graphic organiser.
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## Reflecting

Why did European settlers invent many new pieces of equipment on arrival to Australia?

How have inventions helped or hindered Australian agriculture?



# Agriculture

## BLM 1

Name \_\_\_\_\_

Aboriginal farming	European farming
Fire-stick farming	
Fish traps	
Eel traps	
Poisons for fishing	





# Agriculture

## BLM 2

Name \_\_\_\_\_

### Cause 1

\_\_\_\_\_

### Effect on Australian environment

\_\_\_\_\_

### Cause 2

\_\_\_\_\_

### Effect on Australian environment

\_\_\_\_\_

### Cause 3

\_\_\_\_\_

### Effect on Australian environment

\_\_\_\_\_

### Cause 4

\_\_\_\_\_

### Effect on Australian environment

\_\_\_\_\_



# Agriculture

## BLM 3

Name \_\_\_\_\_

Identify the positive (plus), negative (minus) and interesting aspects of permaculture in Australian farming.

Plus	Minus	Interesting



# Health

## Introduction

*Health* initially introduces us to how Aboriginal people used their available resources in innovative ways to avoid and cure sickness and heal wounds. The text goes on to explain the inventions of things such as analgesics, antivenenes, the bionic ear and disposable medical equipment. It also discusses IVF and how the Royal Flying Doctor Service brought medical treatment to outback patients.

## Australian Curriculum links

This text links with the Australian Curriculum in History and Science at Year 5.

## Understandings

- Innovations in Australian health often reflect the unique needs of Australians.
- Australia has contributed to worldwide health with inventions such as the bionic ear and disposable medical equipment.
- Innovations in medicine are continually happening.

## Vocabulary

allergic, antibiotics, antivenenes, bacterium, biodegradable, bionic, cells, dysentery, engineer, epidemic, immunity, intellectual property, laser, lenses, missionary, patent, pathology, pharmacist, psychology, scurvy, sterilised, toxicology, transplant, vaccine, viruses

## Focusing

### Discussion questions

Have students answer these questions orally to focus on the text.

#### **Literal:**

- How did Aboriginal people traditionally treat illnesses? (Herbal medicines from the bush and rites performed by healers)
- Where can an antibody to a redback spider bite be found? (In horses)
- What is Auslan? (Australia's own sign language for deaf people)
- What does Skin Polarprobe detect? (Melanomas, skin cancer)
- Who discovered that bacteria can survive in the stomach and cause infection? (Doctors Barry Marshall and Robin Warren)
- What does 'in-vitro' mean? (In a glass dish or a test tube)
- What did Dr Fiona Wood invent? (Spray-on skin)

#### **Inferential:**

- How did Aboriginal people know so much about healing?
- Why was aspirin developed in Australia?
- Why is it important to immobilise a person bitten by a spider?
- Why was Australia one of the first countries in the world to make a snake antivenene?
- Why is fast detection of cancerous cells important?
- Why is it important that latex gloves are biodegradable?
- What is microsurgery?

***Evaluative:***

- How has the Australian health system changed since 1788?
- How does the bionic ear benefit people who are hearing-impaired?
- Do you think it is important for doctors to wear gloves? Why?
- Why is spray-on skin important for burn victims?

## Engaging

Learning experience 4	Innovations in Australian health often reflect the unique needs of Australians.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 4–11 of <i>Health</i></li> <li>• BLM 4</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Identifying</li> <li>• Recording ideas visually</li> <li>• Locating and interpreting relevant information</li> <li>• Recording facts</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Comparing</li> <li>• Designing</li> <li>• Investigating</li> <li>• Interpreting</li> </ul>
<b>Activity</b>	<p><b>1</b> Have students reread the Ailments and Remedies chart on page 6 of <i>Health</i>. Then have students complete the graphic organiser on BLM 4, comparing Aboriginal remedies with Western remedies. Ask, Where do the Aboriginal remedies come from? Where do the Western remedies come from? Do you think Western health care could learn from Aboriginal health care?</p> <p><b>2</b> Have students re-read about the possible health implications from overuse of analgesics on page 9 of <i>Health</i>. Ask, What did people do to avoid a headache? Why was overuse dangerous? What could analgesics do to your kidneys? How did the government prevent this from happening? Have students design a poster that advertises the risks of analgesics and warns Australians about their overuse.</p>
<b>Going further</b>	<p><b>3</b> Discuss with students the treatments available for bites from redback spiders, Sydney funnel-web spiders and snakes. Construct a class chart that outlines the various treatments available for these and other poisonous Australian animals, such as box jellyfish, blue-ringed octopus, white-tailed spider, brown snake and saltwater crocodile.</p> <p><b>4</b> As an extension, discuss with students the course of events that led to the invention of the Snake Venom Detection Kit. Have students explain to another class member how the kit works and the impact this invention has had on the lives of many Australians.</p>
<b>Assessment</b>	Assess students' ability to understand Australia's unique health needs through their comprehension of Aboriginal remedies and treatment of bites from Australian poisonous animals.

Learning experience 5	Australia has contributed to worldwide health with inventions such as the bionic ear and disposable medical equipment.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 12–21 of <i>Health</i></li> <li>• BLM 5</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Recording ideas visually</li> <li>• Speaking and listening</li> <li>• Using persuasive language</li> <li>• Presenting a procedure</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Sequencing</li> <li>• Designing</li> <li>• Organising</li> <li>• Evaluating</li> </ul>
<b>Activity</b>	<ol style="list-style-type: none"> <li>1 Have students re-read pages 12–13 of <i>Health</i> and discuss with students how the ear works. Ask, How does the cochlear implant help those who cannot hear? How many people around the world now have a bionic ear? Why is it called a bionic ear? Have students design a flow diagram that demonstrates how a cochlear implant works. Have students share their illustrated procedure with an adult.</li> <li>2 Discuss with students in the meaning of ‘melanoma’ and how melanomas develop. Ask, How can melanomas be avoided? Why does Australia have such a high incidence of melanoma? Why does melanoma need to be detected early? Why is the SolarScan important for other countries? Have students design a pamphlet that educates people around the world about how to avoid melanomas.</li> <li>3 ‘Around 3 per cent of Australian babies are now born with assistance from IVF treatment.’ Ask, How was IVF was developed? Why was IVF developed? Where was the first IVF baby born? Discuss with students how IVF may help some parents who are unable to conceive naturally. Have students complete a PMI chart on IVF.</li> </ol>
<b>Going further</b>	<ol style="list-style-type: none"> <li>4 Discuss with students the inventions created in Australia that have contributed to improving the lives of people around the world. Create a class list with students. Ask students to indicate which invention they believe has been the most beneficial to Australian and overseas health and why. Collate students’ opinions and order the class list, rating each invention.</li> <li>5 Have students complete the KWL chart on BLM 5 to indicate what they know about Australian health, what they would like to know and what they have learned after reading <i>Health</i> and doing the activities.</li> </ol>
<b>Assessment</b>	Assess students’ ability to understand how Australia has contributed to worldwide health care through their presentation of the KWL graphic organiser, bionic ear procedure and melanoma pamphlet.

Learning experience 6	Innovations in medicine are continually happening.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 22–29 of <i>Health</i></li> <li>• BLM 6</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Developing arguments</li> <li>• Presenting information</li> <li>• Responding to a text</li> <li>• Researching</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Role-playing</li> <li>• Interpreting</li> <li>• Arranging</li> <li>• Sequencing</li> </ul>
<b>Activity</b>	<ol style="list-style-type: none"> <li>1 Have students re-read the section on pedal radios on page 22 of <i>Health</i>. Ask, Who experimented with pedal radios? What was the pedal radio used for in the 1920s? Who helped with the generator? Have students role-play an emergency situation being radioed in to emergency services in the 1920s.</li> <li>2 Discuss with students the work completed by Earl Owen and the contributions he made to surgery techniques. Have students complete a timeline that sequences Earl Owen's contributions towards microsurgery.</li> <li>3 Consider with students the timeline on page 30. Ask, When did most inventions occur? Why do you think so many happened at this time? Do you think there will be many more inventions in the next 10 years? In what areas of health do you think inventions will occur? Have students continue the timeline, inserting three inventions they believe will occur in the next 10 years.</li> </ol>
<b>Going further</b>	<ol style="list-style-type: none"> <li>4 Discuss with students the contribution that John Flynn made to Australian health. Ask, After experimenting with the pedal radio, what did he go on to develop? What was so innovative about a flying ambulance? Have students look at a map of the world and identify other countries that would benefit from using a service like the Flying Doctors. Discuss with students the advantages of a flying doctor service to those living in remote areas.</li> <li>5 As an extension, discuss with students how dentistry is changing, thanks to the invention of the Dental Laser Ultrasound. Have students use BLM 6 to illustrate how dentistry has changed over time.</li> <li>6 As an investigative extension, encourage students to research the 1918 influenza epidemic. Discuss with students why this epidemic is unlikely to occur again.</li> </ol>

<b>Assessment</b>	Assess students' ability to understand how innovations in medicine are continually developing through presentation of their dentistry graphic organiser, discussions about the flying doctor service and the 1918 influenza epidemic and ideas presented in their future inventions timeline.
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## Reflecting

After reading about discoveries and inventions in Australian health, which invention would you like to learn more about and why?

In which areas of Australian health do you believe more research is needed and why?





# Health

## BLM 4

Name \_\_\_\_\_

Ailment	Aboriginal remedy	Western remedy
Headache		
Stomach upset		
Stings		
Broken bones		
Infections		



# Health

## BLM 5

Name \_\_\_\_\_

Record what you know about Australian health (K), what you would like to know (W) and what you have learned (L) after reading *Health* and doing the activities.

K	W	L



# Health

## BLM 6

Name \_\_\_\_\_

Give examples of how dentistry has changed over time.

1900	2000	2030



# Home

## Introduction

*Home* introduces us to how Australian inventions have helped us at home, from early inventions like the billy can and Victa lawn-mower to later inventions such as the shed and the ice-making machine. The text also describes food innovations and sporting inventions.

## Australian Curriculum links

This text links with the Australian Curriculum in History and Science at Year 5.

## Understandings

- Aboriginal people and early European settlers invented what they needed by using natural resources and to suit their environment.
- Many Australians became famous after inventing domestic items that became household names.
- Iconic Australian foods, sports and household items have become an integral part of Australians' daily lives.

## Vocabulary

amateur, cistern, didgeridoo, evaporated, exporting, galvanised, ground art, hybrid, ice boxes, incubators, insulated, intellectual property, multicultural, nutrients, patent, perforated, refrigeration, salination, scabbard, smoulder, test match, turf

## Focusing

### Discussion questions

Have students answer these questions orally to focus on the text.

#### **Literal:**

- What did Aboriginal people make clothes from? (Animal skins and plant fibres)
- What are billy tongs? (A forked stick plus a straight stick to grip the rim of a billy can)
- What were the leaves of the cabbage palm used for? (They were woven into a hat.)
- What is Major Sir Thomas Mitchell known for? (Being Surveyor-General of the Colony of New South Wales)
- What is damper? (Bread baked in the hot ashes of a fire)
- When and where was the Esky developed? (1952 in Australia)
- Where did the idea of the Australian crawl come from? (Alick Wickham learned a similar style in the Solomon Islands)

#### **Inferential:**

- Why did Aboriginal people use shells, feathers, seeds and bones to make ornaments?
- Where does the name 'Victa' (the lawn-mower) come from?
- How are 'saltsoaker' plants good for Australian conditions?
- Why is a Shepherd castor useful?
- Why is it important for surf lifesavers to have reliable equipment?
- Why is the large Super Sopper called 'the Whale'?

#### **Evaluative:**

- How useful would a canvas waterbag be in the outback?
- In which area of the home have most inventions been made? Why do you think this is the case?

## Engaging

Learning experience 7	Aboriginal people and early settlers invented what they needed by using natural resources and to suit their environment.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 4–9 of <i>Home</i></li> <li>• BLM 7</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Summarising</li> <li>• Cause and effect</li> <li>• Literal and inferential comprehension</li> <li>• Researching information</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Presenting</li> <li>• Describing</li> <li>• Sequencing</li> <li>• Designing</li> <li>• Comparing</li> </ul>
<b>Activity</b>	<ol style="list-style-type: none"> <li>1 'Before being cooked, many bush foods need special preparation to be edible.' Discuss with students this statement on page 6 of the text. Ask, Is this similar to any Western foods prepared in your home? What foods did the Aboriginal people prepare and how? Have students choose one food and describe to a classmate how that food was traditionally prepared by Aboriginal people.</li> <li>2 Discuss with students the resources Aboriginal people had available or did not have available to prepare a fire in the past. Have students prepare a flow chart with labelled illustrations that shows the traditional Aboriginal way to make a fire.</li> <li>3 Have students re-read about the cabbage-tree hat on page 8 of <i>Home</i>. Discuss with students why such a hat is essential. Encourage students to create a class list of other famous Australian hats and what their purpose was. Have students complete BLM 7, illustrating the uses for each Australian hat.</li> </ol>
<b>Going further</b>	<ol style="list-style-type: none"> <li>4 Have students re-read the section on clothes and body decoration on page 6 of <i>Home</i>. Discuss with students what was traditionally used by Aboriginal people to create jewellery or decorations. Encourage students to design a piece of jewellery or an ornament made from leaves, seeds, feathers or other resources available to them in the natural environment.</li> <li>5 Discuss with students the purpose of the billy can and how it is used in the Australian bush. Ask, How did the invention of the billy can assist settlers and explorers in Australia? Have students write a recipe that would be suitable for a travelling worker in the Australian bush to prepare in their billy can. Collect students' recipes and collate a class recipe book, 'Billy Can Recipes for the Australian Bush'.</li> </ol>
<b>Assessment</b>	Assess students' ability to understand how Aboriginal people and early settlers invented what they needed by using natural resources and to suit their environment.

Learning experience 8	Many Australians became famous after inventing domestic items that became household names.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 10–15 of <i>Home</i></li> <li>• BLM 8</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Listing</li> <li>• Considering options</li> <li>• Recording ideas visually</li> <li>• Locating and selecting relevant information</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Generating ideas</li> <li>• Inventing</li> <li>• Understanding</li> <li>• Applying prior knowledge</li> </ul>
<b>Activity</b>	<ol style="list-style-type: none"> <li>1 Have students re-read pages 14–15 of <i>Home</i>. Ask, What percentage of Australia is dry? Why is it important for Australians to find new ways of saving water? What have Australians invented to date that assists in saving water? Have students invent alternative names for the dual-flush toilet cistern, ‘green’ toilet paper and the Hybrid Toilet System. List alternative names as a class and vote on the most popular name for each item.</li> <li>2 ‘A Hills Hoist can be found in many Australian backyards.’ Discuss with students who invented the Hills Hoist and why it was invented. Have students complete the graphic organiser on BLM 8 to illustrate how the Hills Hoist came about.</li> <li>3 Have students re-read pages 10–15 of <i>Home</i> and identify each time an invention was created by accident and as a need arose. Discuss students’ findings.</li> </ol>
<b>Going further</b>	<ol style="list-style-type: none"> <li>4 Discuss with students that during the opening ceremony for the 2000 Sydney Olympic Games numerous iconic items, such as the Victa lawn mower, were featured. After reading <i>Home</i>, list the items that are mentioned as appearing in the opening ceremony. Encourage students to work in small groups to create their own list of iconic Australian items that could be included in an Australian ceremony.</li> <li>5 ‘... ways for Australians to use less water at home are eagerly sought.’ Discuss with students how they presently save water in their household. Ask, In what ways could your household save more water? Encourage students to invent a new way of saving water for their household.</li> </ol>
<b>Assessment</b>	Assess students’ ability to understand how many Australians became famous after inventing domestic items that became household names, through class discussions and presentation of their graphic organiser on the Hills Hoist.

Learning experience 9	Iconic Australian foods, sports and household items have become an integral part of Australians' daily life.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 16–29 of <i>Home</i></li> <li>• BLM 9</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Speaking and listening</li> <li>• Recording survey information</li> <li>• Persuasive language</li> <li>• Presenting information</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Comparing</li> <li>• Describing</li> <li>• Justifying</li> <li>• Collating</li> </ul>
<b>Activity</b>	<ol style="list-style-type: none"> <li>1 Discuss with students the foods that have been invented in Australia as outlined on pages 16–17 of <i>Home</i>. Ask, Which iconic Australian food is your favourite and why? Have students create a Venn diagram that compares four Australian foods.</li> <li>2 'Australia is famous for many treats and snacks.' Discuss this statement with students. Ask, Does Australia have as many national dishes as other countries? Are our national foods famous overseas? Have students use BLM 9 to conduct a class survey on likes and dislikes of Australian foods.</li> <li>3 Have students re-read pages 18–19 of <i>Home</i>. Ask, Which household item would you find most useful and why: the Aussie Chopstick, the StaySharp knife, the Splayd or the notepad? Have students draw a labelled diagram of their chosen household item, identifying its many merits.</li> </ol>
<b>Going further</b>	<ol style="list-style-type: none"> <li>4 Have students choose one of the famous Australian foods on pages 16–17 of <i>Home</i>. Have students imagine they are in another country and have to describe in detail their chosen food to someone who has never seen or tasted it. Have students work in pairs to describe the Australian food to their partner.</li> <li>5 Have students re-read 'Sport' on pages 24–29 of the text. Ask, Do you play an Australian sport? Which Australian sports are played overseas? How is Australian Rules football a mix of many games? Have students invent other ways to make backyard cricket more exciting and present their ideas to the class. Choose three new rules and try them in a game of backyard cricket.</li> </ol>
<b>Assessment</b>	Assess students' ability to understand how iconic Australian foods, sports and household items have become an integral part of Australians' daily lives, through class discussions, class survey on Australian foods, food descriptions and labelled diagram of a household item.

## Reflecting

Which household items do you now realise are Australian inventions after reading *Home*?

Why is it important to patent any new ideas?

Are there any inventions mentioned in *Home* that you would like to learn more about?





# Home

## BLM 7

Name \_\_\_\_\_

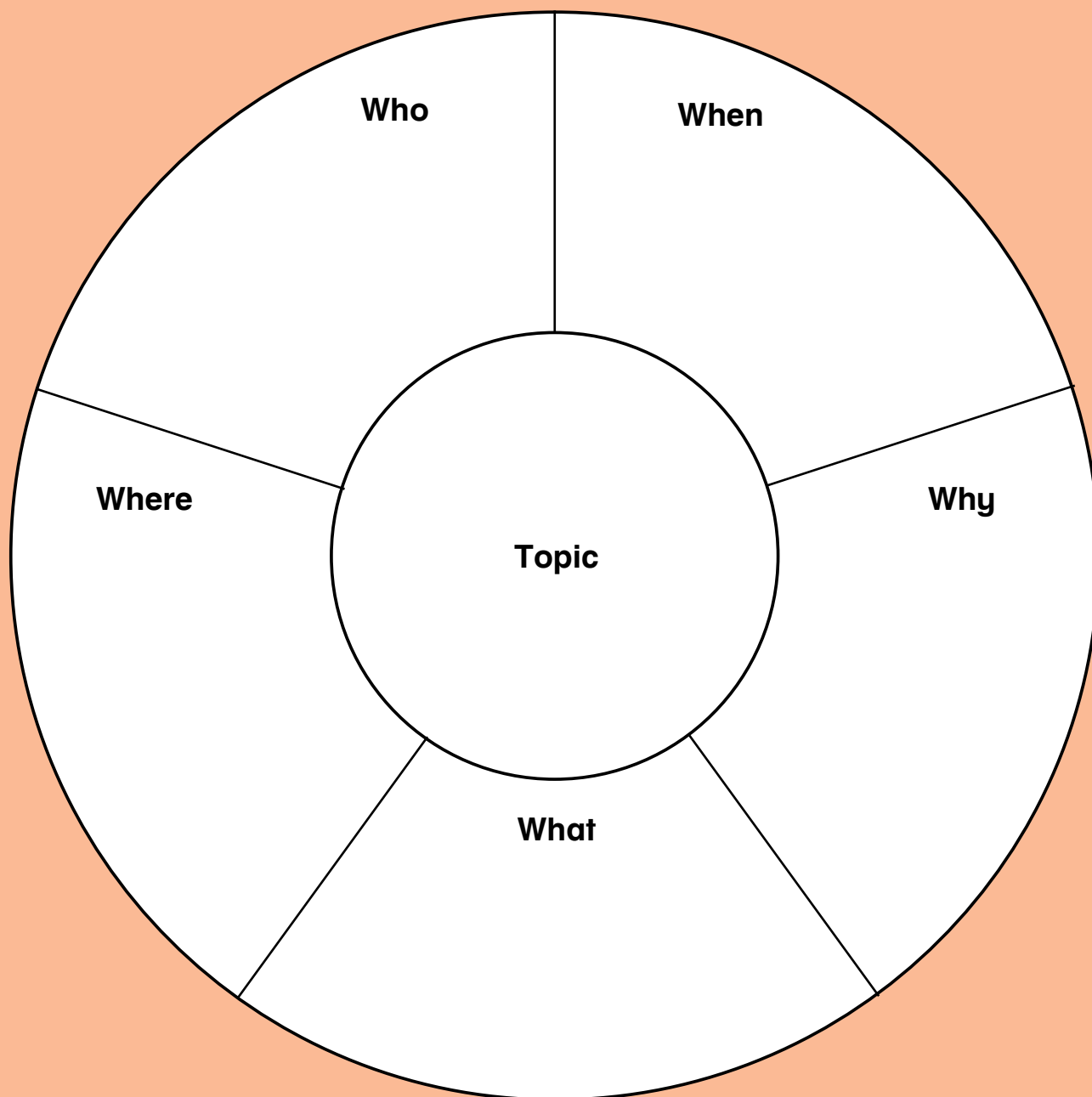
Australian hat	When invented	Used by	Used where
Cabbage-tree hat			
Slouch hat			
Akubra			
Outback hat			
Quartered cap			



# Home

## BLM 8

Name \_\_\_\_\_





# Home

## BLM 9

Name \_\_\_\_\_

Survey your classmates about whether or not they like these Australian foods and what is their favourite one. Record your results in the table below.

Food	Do you like this Australian food?		Favourite Australian food
	Yes	No	
Anzac biscuits			
Lamingtons			
Damper			
Mio			
Vegemite			



# Technology

## Introduction

*Technology* outlines the advances in technology in Australia, beginning with inventions by Aboriginal people and discoveries made by European settlers, to recent Australian inventions. The text introduces the reader to innovations in transport, including aviation and the motor vehicle industry, as well as looking at technological advances in housing, mining, textiles and the environment.

## Australian Curriculum links

This text links with the Australian Curriculum in History and Science at Year 5.

## Understandings

- Although Australia has a small population, it has developed many innovative technologies.
- A number of Australian innovations have been developed to reduce the effects of environmental disasters and to protect our environment.
- Australian inventions in technology have been developed by engineers, scientists and people in the transport industry.

## Vocabulary

astronomer, audio-tactile, batten, bearings, biodegradable, biplanes, braille, draughtsman, engineer, evaporate, fitter and turner, friction, furnace, GPS (Global Positioning System), hulls, hydraulic, intellectual property, laser, microwave, mulching, network, patent, pedestrian, piston, PVC (polyvinyl chloride), satellite, sonar, speech synthesiser, telecommunications, textiles, tripod

## Focusing

### Discussion questions

Have students answer these questions orally to focus on the text.

#### **Literal:**

- What is a woomera? (A thin, flat piece of wood with a hook at one end)
- Why did the Aboriginal people of northern Australia build their homes off the ground? (To keep the rain out and to provide space to build a fire to warm the house)
- What is an EXELGRAM? (A kind of hologram, a picture made by mixing images created with laser beams, printed on metal foil)
- Why are Australian bushfires especially severe? (Australian gum trees contain a lot of oil from the eucalyptus that burns fast and hot)
- Where, when and by whom was the first brick-veneer structure developed? (Swan Hill, Victoria, in 1850 by Peter Beveridge)
- Who invented inflatable emergency slide rafts? (Jack Grant)

#### **Inferential:**

- Why did Aboriginal people move around the land?
- How do shelters containing paintings and engravings tell us a lot about Australia's past?
- Why is the black box flight recorder a useful piece of technology?
- Why is the orbital engine popular among car manufacturers?
- Why would postage stamps be more successful than pre-paid paper cover?
- Why is QuickDry Merino wool good for the environment?
- Where does the idea of the ute come from?
- Why was the kangaroo bicycle unsuccessful?

***Evaluative:***

- How did Aboriginal people use what was available to them within their environment?
- How does the ute reflect the Australian way of life?

## Engaging

Learning experience 10	Although Australia has a small population, it has developed many innovative technologies.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 4–12 of <i>Technology</i></li> <li>• BLM 10</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Questioning and answering</li> <li>• Recording ideas visually</li> <li>• Listing</li> <li>• Speaking and listening</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Researching</li> <li>• Comparing</li> <li>• Explaining</li> <li>• Creating</li> </ul>
<b>Activity</b>	<ol style="list-style-type: none"> <li>1 Have students re-read pages 6–7 of the text about Aboriginal people's tools for hunting. Ask, What tools did they use for hunting? Did they use different tools for different hunting activities? Have students use BLM 10 to complete a question-and-answer chart about Aboriginal hunting tools.</li> <li>2 Traditionally, Aboriginal people built different styles of housing, depending on a number of factors. Ask, What materials did Aboriginal people use to build their homes? What factors determined where, when and how Aboriginal people built their homes? In what ways did traditional Aboriginal shelters suit their way of life? Have students create a model structure suitable for sleeping in, using materials found in their backyards.</li> <li>3 Have students read about Lawrence Hargraves's flight experiments on page 11 of <i>Technology</i>. Ask, What was Hargraves's profession? How did his profession give him the background knowledge he needed for his flight experiments? What was Hargraves interested in? What did Hargraves build? Have students create a Venn diagram that compares Hargraves's first box kite with a modern-day aeroplane. Have students share the similarities and differences with their peers.</li> </ol>
<b>Going further</b>	<ol style="list-style-type: none"> <li>4 After students have read pages 6–7 of <i>Technology</i>, list the various tools used traditionally by Aboriginal people. Have students investigate tools used traditionally by other indigenous groups from countries such as New Zealand, Canada and South America. Complete a comparison chart that compares the tools used traditionally by indigenous groups from around the world.</li> <li>5 As an extension, discuss with students the purpose of a message stick. Ask, What is a message stick? How did Aboriginal people use a message stick?</li> </ol>
<b>Assessment</b>	Assess students' ability to understand that, although Australia has a small population, it has developed many innovative technologies, through students' contribution to class discussions and presentation of a question-and-answer graphic organiser.

Learning experience 11	A number of Australian innovations have been developed to reduce the effects of environmental disasters and to protect our environment.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 13–22 of <i>Technology</i></li> <li>• BLM 11</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Explaining</li> <li>• Using persuasive language</li> <li>• Following a procedure</li> <li>• Describing</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Designing</li> <li>• Mapping</li> <li>• Researching</li> </ul>
<b>Activity</b>	<ol style="list-style-type: none"> <li>1 Discuss Clean Up Australia Day with students. Ask, Have you participated in Clean up Australia Day? What is the purpose of the day? Do you think it is a good idea? What happens on Clean Up Australia Day? Have students draw a map of their neighbourhood and design a plan for people who are participating in the day in their neighbourhood. Have students explain their plan to another student.</li> <li>2 ‘Australia is a land of sunshine.’ Discuss with students the uses for this abundant sunshine. Ask, What is solar energy? What is solar energy used for? Have students draw a procedural flow chart that outlines how the Solahart heats water.</li> <li>3 Discuss with students the School of the Air as outlined on page 21 of the text. Ask, What is the School of the Air? Who invented the School of the Air? Why was it invented? How does it help students who live in remote communities? ‘Students gathered each year to meet their classmates and teachers and enjoy special activities.’ Have students plan this once-a-year full-day get-together.</li> <li>4 Have students use BLM 11 to illustrate the positive, minus and interesting aspects of the School of the Air on the PMI graphic organiser.</li> </ol>
<b>Going further</b>	<ol style="list-style-type: none"> <li>5 As an extension, have students design a poster that promotes the installation of solar water heaters. Ask, What are the benefits of using solar power?</li> <li>6 Have students re-read about postage stamps on page 19 of <i>Technology</i>. Ask, What is the purpose of a postage stamp? Have students design a postage stamp that reflects their local community.</li> </ol>
<b>Assessment</b>	Assess students’ ability to understand that innovations have been developed to reduce the effects of environmental disasters and to protect our environment through their Clean up Australia Day plan, solar water heater brochure and postage stamp design.

Learning experience 12	Australian inventions in technology have been developed by engineers, scientists and people in the transport industry.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Pages 23–29 of <i>Technology</i></li> <li>• BLM 12</li> <li>• Book and non-book resources about inventions and discoveries</li> </ul>
<b>Language and literacy skills focus</b>	<ul style="list-style-type: none"> <li>• Illustrating cause and effect</li> <li>• Justifying</li> <li>• Note taking</li> <li>• Interviewing</li> </ul>
<b>Thinking skills focus</b>	<ul style="list-style-type: none"> <li>• Making connections</li> <li>• Researching</li> <li>• Applying prior knowledge</li> <li>• Investigating</li> </ul>
<b>Activity</b>	<p><b>1</b> Have students re-read pages 23–29 of the text and record the cause of inventions being developed, for example, shrinking socks leading to the development of shrink-proof socks. Have students illustrate their cause-and-effect chart.</p> <p><b>2</b> After reading pages 23–29, discuss with students how Australian inventions have contributed to making society safer. Have students complete the KWL chart on BLM 12 illustrating what they know, what they want to know and what they have learned about the safety aspects of either the Safe-n-Sound baby capsule or the audio-tactile pedestrian detector crossing system.</p>
<b>Going further</b>	<p><b>3</b> Have students read about CSIRO on page 25 of <i>Technology</i>. Ask, What does CSIRO do? As an extension, have students investigate current CSIRO projects. Encourage students to share one current project that they believe will make an impact on society in the future. Have students justify their choice.</p> <p><b>4</b> Have students re-read about Ben Lexcen on page 29 of <i>Technology</i>. Encourage students to write a list of interview questions outlining what else they would like to know about his yacht designs. Have students research Ben Lexcen's life and his yacht design, taking notes alongside their specific questions. Have students role-play an interview with Ben Lexcen, using their questions and researched answers.</p>
<b>Assessment</b>	Assess students' ability to understand that inventions have been developed by engineers, scientists and people in the transport industry through students' contribution to class discussions, an interview and a safety flow chart.

## Reflecting

What do you believe has been the greatest technological invention made in Australia?

What Australian technological inventions do you use in your home?





# Technology

## BLM 10

Name \_\_\_\_\_

Question	Answer
What _____ _____ _____?	
Where _____ _____ _____?	
When _____ _____ _____?	
How _____ _____ _____?	



# Technology

## BLM 11

Name \_\_\_\_\_

Plus	Minus	Interesting



# Technology

## BLM 12

Name \_\_\_\_\_

K	W	L